

suspended at Diamant's own suggestion before the stipulated time had expired. Diamant was then released from his position, absented himself, and left the question unsettled. The experiments cost more than 30,000 florins, which had been advanced by the Imperial paper mill, according to orders from the late Baron Bruck. With this, the past operations of maize straw paper were closed as far as the experiments were conducted under Diamant's direction. Diamant did not participate in subsequent experiments.

The Imperial paper mill had now to rely on itself. The exertions of the direction under whose superintendence the experiments were continued, aimed principally at two things; first to reduce the cost of production by improvements in the mode of manufacture—secondly to ascertain what the expenses would be, if, instead of the whole straw, only the envelop of the grain cob (the sheathing leaves enclosing the corn head), containing fibres of the best and finest quality were used for making paper.

If these industriously continued experiments did not lead directly to the desired result, that of making paper as cheap out of maize straw as out of rags, they led at least indirectly to improvements and what is of greater weight, to a very important result—the discovery of a new fibre capable of being spun and woven, and the waste of which fibre furnishes a cheap paper.

The origin of this discovery was somewhat as follows:—

It was known that the basis of all paper is vegetable fibre. The rags are but the fibres, produced out of the flax, hemp, or cotton plants, and used up by wearing. If those fibres were used for making paper before they were converted into textures, the paper would be certainly better, but at the same time more costly.

Paper of maize straw is paper of unworn plant fibres. After the idea had once run in this direction, the question arose—cannot the fibres of the maize plant before they are delivered to the paper machine, just as well be worn as the fibres of flax and hemp are first reduced by wear and tear? In other words, cannot the maize fibre be spun and woven. All that was necessary was a trial. It was made, and succeeded. It was found that the maize fibre could be extracted from the plant in a form like flax, by a process very simple, and at the same time requiring but little apparatus and auxiliary means; that it could be spun like flax, and woven like flax thread. The process which I have invented and brought into use, is protected by patents in all the great European States, so as to secure for Austria the priority of the invention.

That the spinning and weaving of the maize fibre is not yet so far advanced as to make paper out of it, is not to be wondered at, for it must be borne in mind that the last-named process has been tried for several years, while the invention of spinning and weaving it has only recently been experimented on, and is consequently yet in its infancy. The textiles of maize flax will look very different in a short time, when practical men have taken it in hand, and the spinning and weaving machinery have been adapted to the maize fibre. No invention has come out of the brain of its author thoroughly complete, all require time to bring them to perfection, so has it been with this. But this

much can be stated with confidence, that the adaptability of maize fibre for spinning and weaving is of the greatest consequence in a commercial point of view, for the cultivation of this plant constitutes one of the most profitable branches of agriculture known, especially in America and parts of Europe. Without taking the corn into consideration which already pays for its cultivation, the various parts of the plants can be utilised in many ways.

By the process employed for producing the maize fibre, the components of the plant are separated into three different parts—fibre, flour-dough, and gluten. The fibres are spun and woven, the nutritive substance (flour-dough) which has the peculiarity of remaining fresh for months in the open air, and, unlike other organic substances, resisting putrefaction gives a pleasant tasting, nutritive, healthy flour dough.

All the fibre and gluten wastes of the maize plant which are precipitated during the process of extracting the fibres, are used for manufacturing paper. The catalogues of the Austrian collection at the London International Exhibition in 1862 in German, French and English, were printed either wholly on maize paper, or on paper made partly of maize fibre and of linen or cotton rags.

The ear and the maize stuff extract furnish food for man. The fibres are woven into clothing, and the shorter fibre and gluten stuff is converted into beautiful paper. After the fibre has served for clothing, it is recovered as rags and manufactured into paper. What plant can boast of such general qualities as maize.

The entire maize plant can be brought into use. The most remarkable thing in regard to the process is its simplicity. The humblest laborer can adopt it when once instructed, and is enabled to produce the above-named article in the field itself without the slightest expense. Where wood is scarce, the lower part of the stalk will supply him with fuel; owners of large farms or manufacturers can produce hundreds of cwt. per day in steam boilers. The material may be bought for cash from the smallest farmer or the largest planter, and brought into the markets of the world.

Austria will endeavour first to acquire enough to supply its own consumption, and then realise a large foreign export. The other countries where maize is grown will follow in the train of this useful application, and the whole world will derive millions of profit by this new branch of industry.

I may close with the following summary: 160 pounds of rags, valued here at about 16 florins, are required for the production of 100 lbs. of foolscap, which paper sells for about 33 florins. Four florins have been paid up to this time at Schlogelmühle for one hundred weight of the maize paper material. From 3 to 3½ cwt. of lischen (head leaves), yield 100 lbs. of paper.

According to official accounts there are in the Austrian dominions more than 2,800,000 yokes (1½ English acres=1 yoke) of ground planted with maize. The produce of lischen or head leaves (grain sheath) may therefore be estimated at 2½ cwt. of lischen at the lowest computation. We may thus take it for granted that 1,200,000 cwt. of rags can be substituted by maize leaves.

One cwt. of head leaves yields, on an average, one-third substance for spinning, one-third for paper